650V N-Channel Super-Junction MOSFET

Features

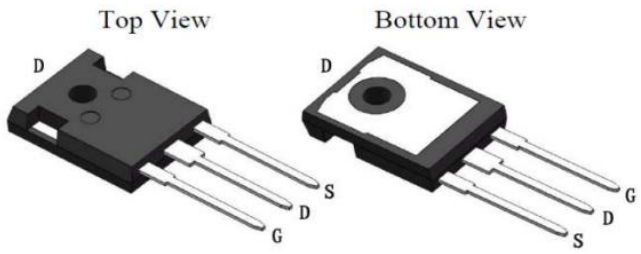
- Much lower On-resistance RDS(ON)
- LowCrss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

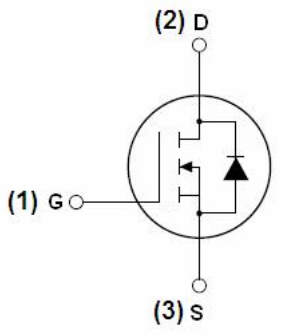
Applications

- LED/LCD/PDP TV and monitor Lighting
- Solar/Renewable/UPS-Micro Inverter System
- Charger
- Power Supply

Product Summary

VDS	650	V
RDS(on),Typ.@VGS=10V	31	mΩ
ID	83	A





TO-247-3

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	650	V
I_D	Drain Current - Continuous (T_C = 25℃)	83	A
	- Continuous (T_C = 100℃)	59	A
I_{DM}	Drain Current - Pulsed (Note 1)	332	A
V_{GSS}	Gate-Source Voltage	±20	V
E_{AS}	Single Pulsed Avalanche Energy	1200	mJ
P_D	Power Dissipation (T_C = 25℃)	633	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.141	W/℃
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	℃
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	℃

* Drain current limited by maximum junction temperature.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 uA	650	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =650V, V_{GS} = 0 V	--	--	5	uA
		V_{DS} =520V, T_C = 125℃	--	--	10	uA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 uA	2.5	4.0	4.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 30A	--	31	37	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 50 V, V_{GS} = 0 V, f = 100 KHz	--	6319	-	pF
C_{oss}	Output Capacitance		--	4232	-	pF
C_{rss}	Reverse Transfer Capacitance		--	27.6	-	pF
Rg	Gate resistance	Vgs=0 V, f=1 MHz	--	7.0	-	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{GS}= 10 V, V_{DS}=400 V, R_G = 27Ω ,I_D=42A	--	171	--	ns
t_r	Turn-On Rise Time		--	111	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	492	--	ns
t_f	Turn-Off Fall Time		--	88	--	ns
Q_g	Total Gate Charge	V_{DS} = 480 V, I_D =42A, V_{GS} = 10V	--	166	--	nC
Q_{gs}	Gate-Source Charge		--	48	--	nC
Q_{gd}	Gate-Drain Charge		--	63	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	83	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	124	A
V_{SD}	Drain to Source Diode Forward Voltage, V_{GS} = 0V, I_{SD} =20A, T_J = 25℃		0.32	0.8	1.2	V
t_{rr}	Body Diode Reverse Recovery Time, I_F=41A,dI/dt=100A/μs		--	192	--	nS
Q_{rr}	Body Diode Reverse Recovery Charge, I_F=41A,dI/dt=100A/μs		--	2.33	--	nC

Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J =25℃, V_{DD} =50V, V_G =10V, R G =25Ω, L=0.5mH,
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

Fig 1. Output Characteristics (Tj=25℃)

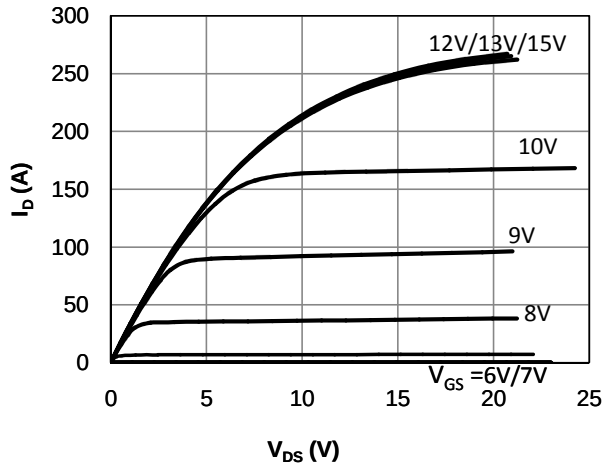


Fig 2. Output Characteristics (Tj=150℃)

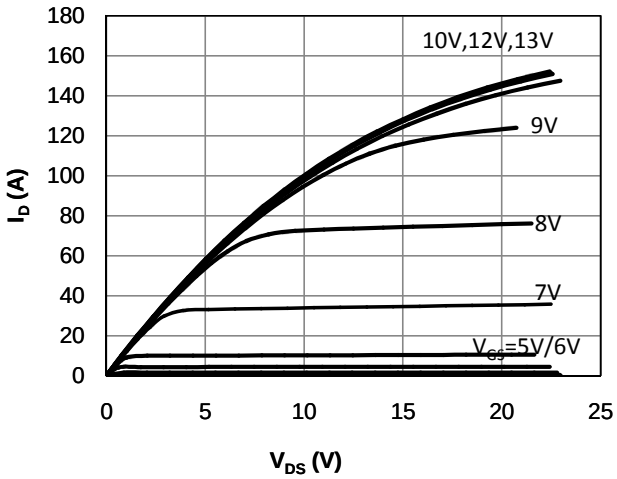


Fig 3: Transfer Characteristics

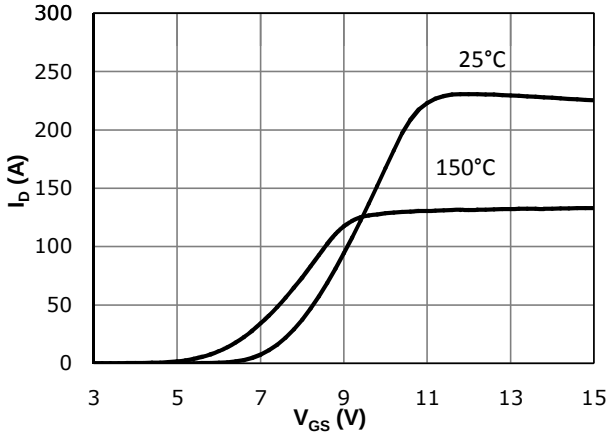


Fig 4: V_{TH} Vs Tj Temperature Characteristics

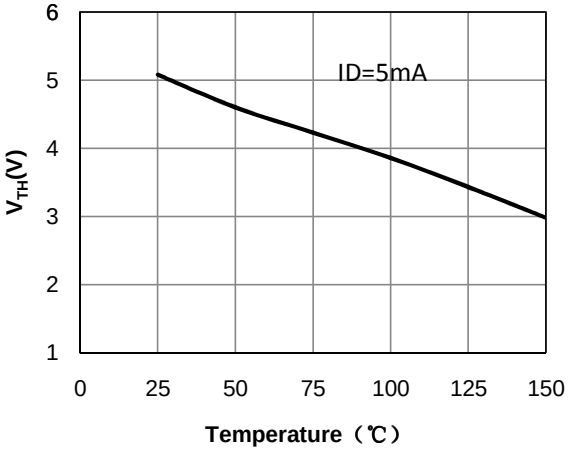


Fig 5: Rdson Vs Ids Characteristics(Tc=25℃)

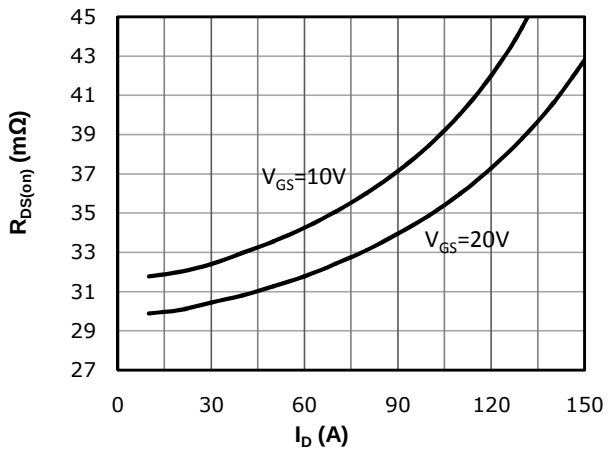


Fig 6: Rds(on) vs. Temperature

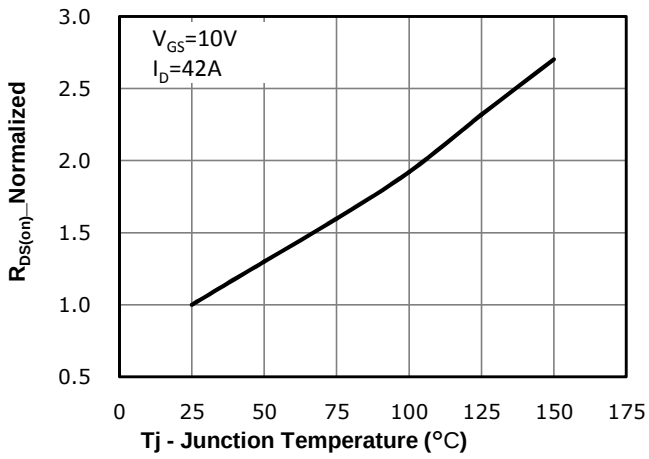


Fig 7: BVDSS vs. Temperature

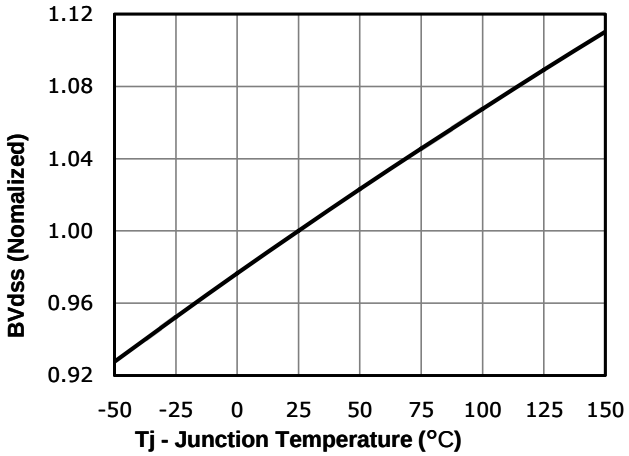


Fig 8: Rds(on) vs Gate Voltage

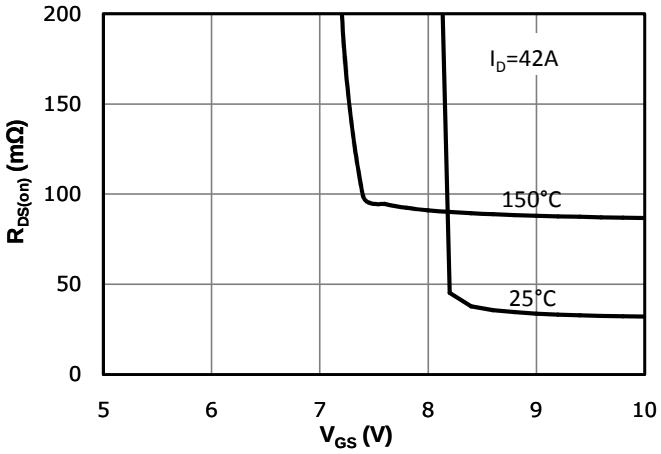


Fig 9: Body-diode Forward Characteristics

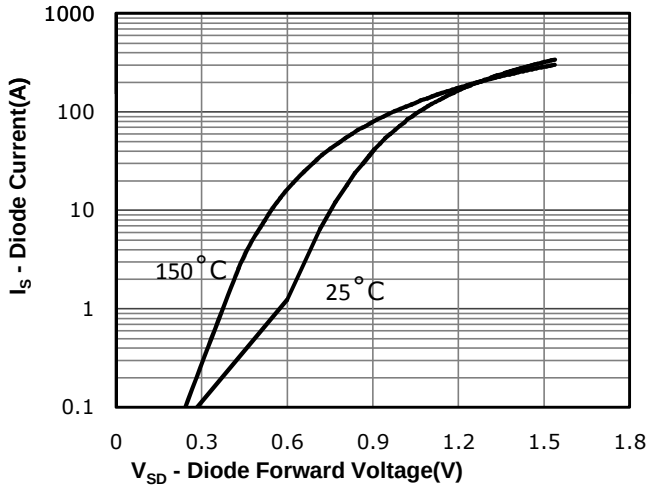


Fig 10: Gate Charge Characteristics

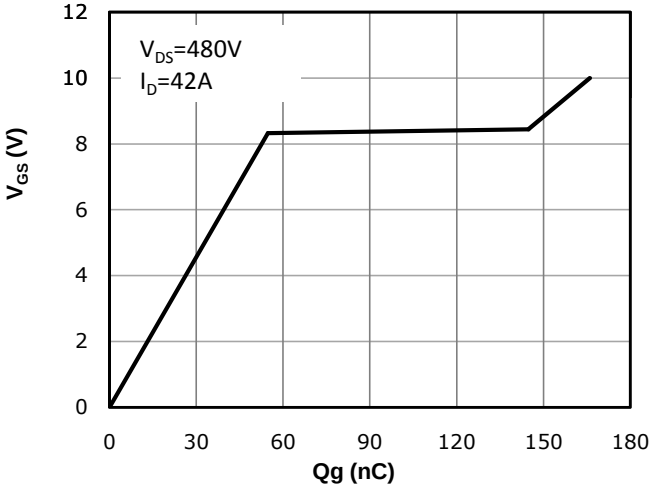


Fig 11: Capacitance Characteristics

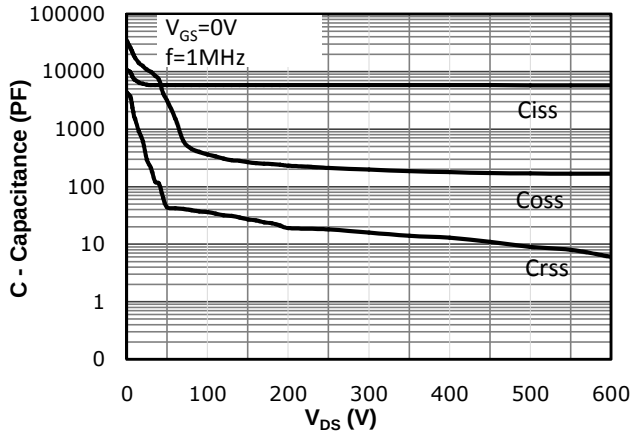


Fig 12: Safe Operating Area

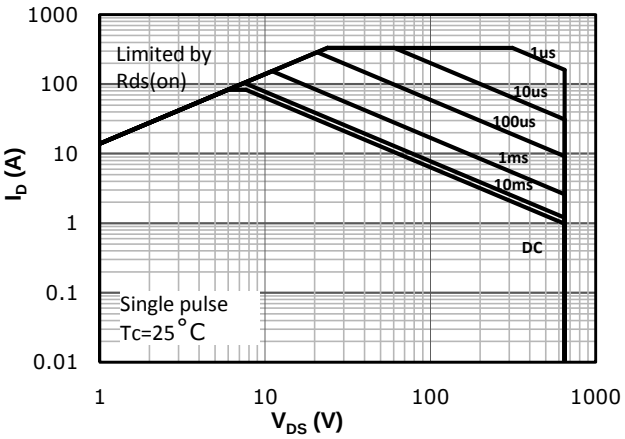
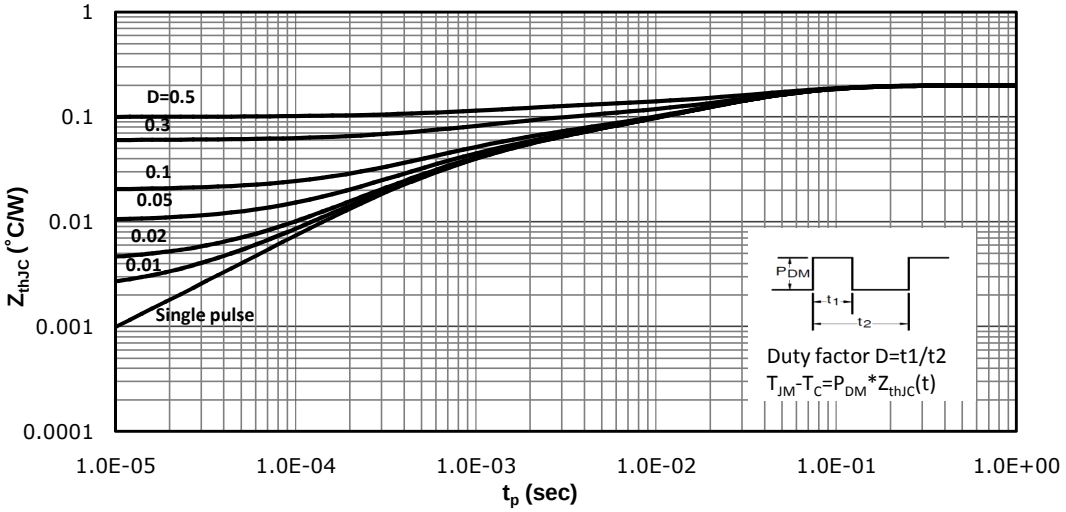
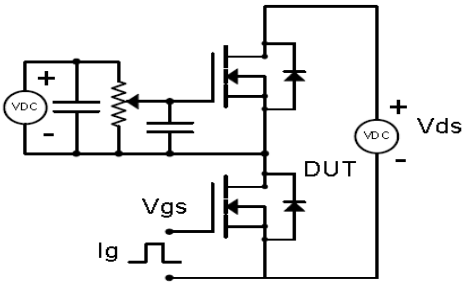
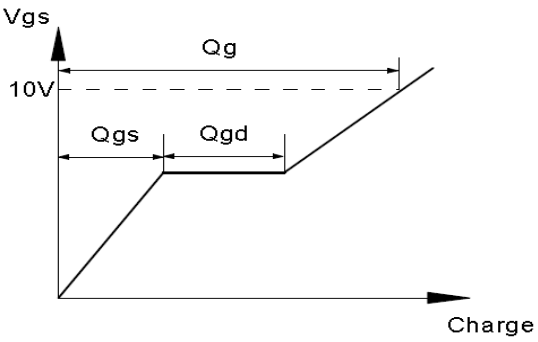


Fig 13: Max. Transient Thermal Impedance

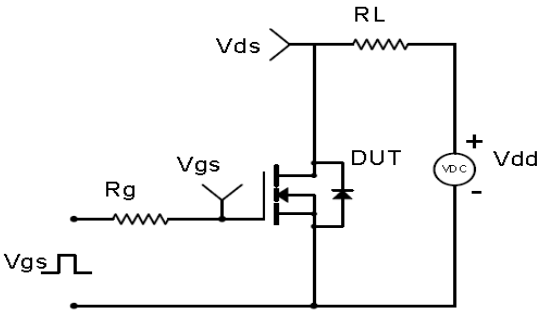


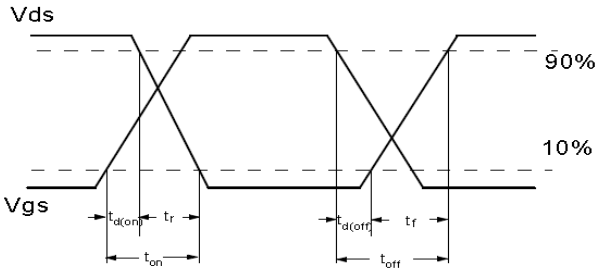
Gate Charge Test Circuit & Waveform



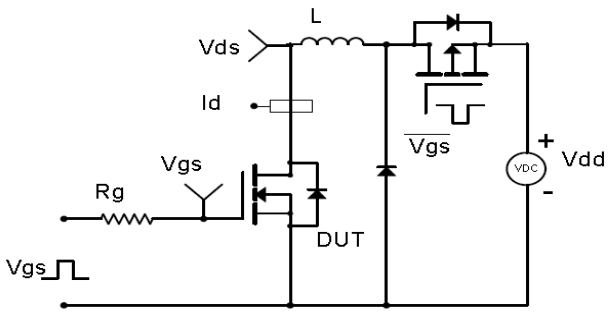


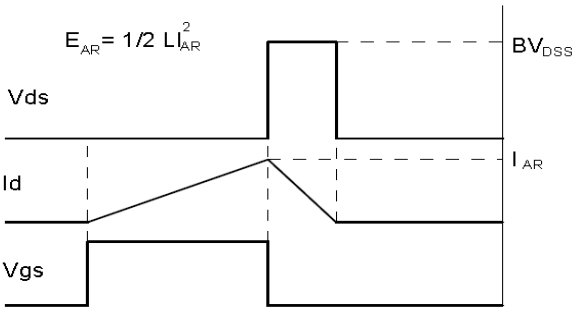
Resistive Switching Test Circuit & Waveforms



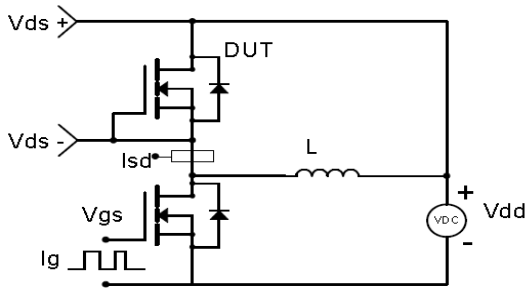


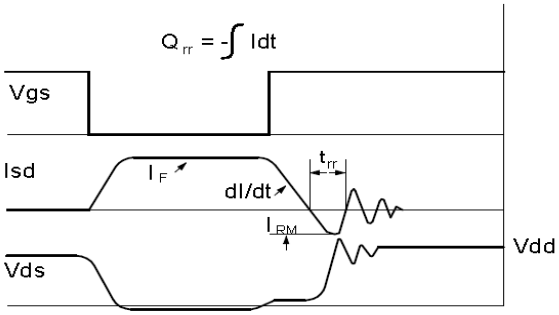
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





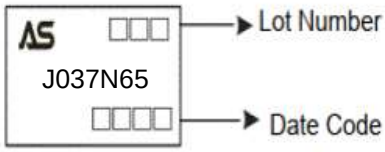
Diode Recovery Test Circuit & Waveforms



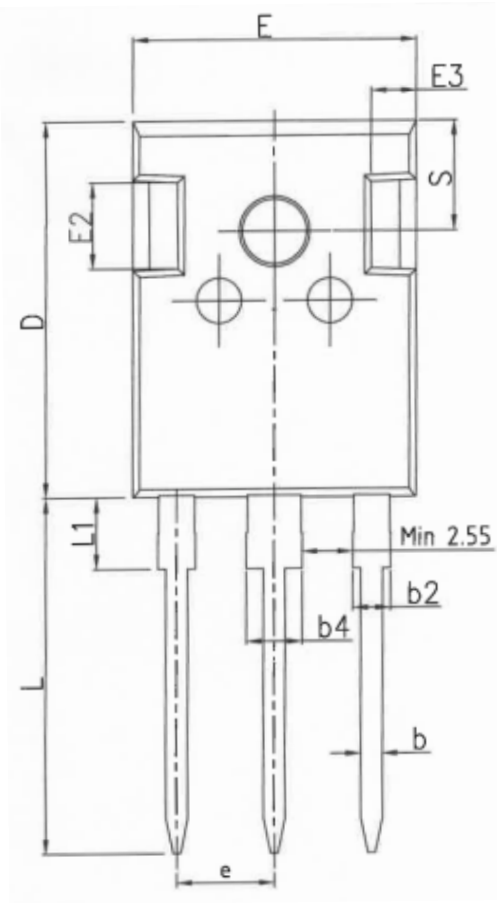


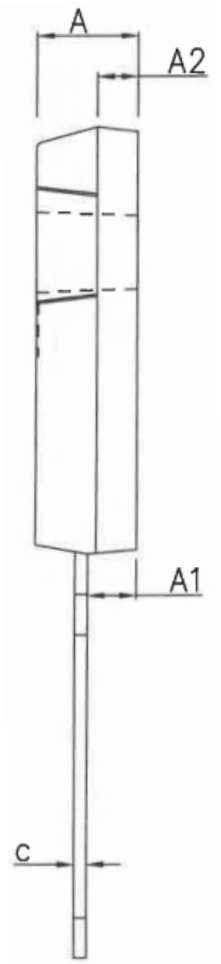
Ordering and Marking Information

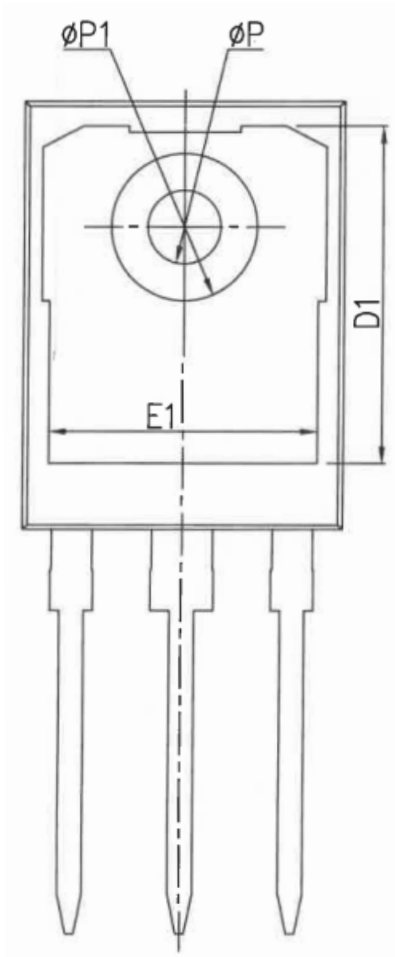
Ordering Device No.	Marking	Package	Packing	Quantity
ASJ037N65L2HF-T	J037N65	TO-247-3	Tape&Reel	30/Reel

PACKAGE	MARKING
TO-247-3	

TO-247 PACKAGE INFORMATION







COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S	6.15BSC		

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